Effect of atmospheric forcing on storm surge modeling and forecasting

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Atmospheric forcing is the primary driver of storm surge, and as such the magnitude of the storm surge impacts depends on various tropical cyclone (TC) characteristics including the size, intensity and impact angle. Although the factors contributing to storm surge are known, uncertainties remain regarding the level of sensitivity to these TC characteristics. From a modeling standpoint, the wind models used as atmospheric forcing to the hydrodynamic models influence the ability of these to accurately forecast storm surge. Improvement of storm surge modeling systems relies on the understanding and advancement of this model coupling. Moreover, understanding the relation between storm surge and TC physical parameters is a key step in increasing forecasting accuracy. The work presented thus seeks to determine the impact of atmospheric forcing in storm surge modeling, and to assess the sensitivity of storm surge to TC physical parameters, specifically focusing on the impact of cyclone landfall angle. To address these two goals, we performed simulations of TCs and their associated storm surge with a coupled WRF-ADCIRC model. First, we explored the use of a parametric vortex wind model versus a full-physics atmospheric model as meteorological forcing. Results highlighted the advantages of using full-physics atmospheric models for this purpose. Secondly, we performed simulations of synthetic TCs to determine the sensitivity of storm surge to cyclone landfall angle. We employed the use of the Hybrid WRF Cyclone Model, a newly developed modeling capability derived from WRF. Results highlighted the sensitivity of storm surge off-shore extent and inundation to the TC impact angle. Moreover, results also point to the importance of coastal and geographic features.

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***Please note special location-FL2/1001-Small Auditorium**

Refreshments 3:15pm

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